

Biodiversity at Your Doorstep

Four seasons of fun for the whole family!

With the Massif des monts Sutton BioKit in hand, come and explore the world of living organisms and their fascinating and constant changes. The Biosphere and its collaborators are pleased to offer you this family activity kit!

The Centre local de développement (CLD) de Brome-Missisquoi and the Corporation de développement économique de Sutton (CDES) are working in collaboration with trail managers and conservation organizations to provide you with a network of environmentally friendly trails that respect biodiversity.

As an environmental museum, the Biosphere encourages citizens to take action and get involved in environmental issues. In addition to presenting exhibits and special events, the Biosphere develops educational and awareness-raising products for a diverse clientele across Canada and is a recognized clearinghouse for environmental information.



Photo: © Isabelle Grégoire

CLD de Brome-Missisquoi: brome-missisquoi.ca

CDES: infosutton.com

Biosphere: ec.gc.ca/biosphere

DID YOU SAY BIODIVERSITY?

Keep your eyes and ears wide open. Biodiversity is all around you with its multitude of living organisms, <u>ecosystems</u> and their complex and organized relationships.

Eco-friendly tips for hikers

- Whisper. Above all, do not shout: you will scare away the animals.
- Stay on the pathways so you do not trample anything.
- **Do not pick** plants and do not bring animals back with you.
- **Keep dogs on a leash** on pathways where they are permitted and make sure to scoop up their feces.
- Do not light a campfire; it is strictly forbidden!
- Leave only your footprints and take only photos!

How the BioKit Works

- 1. Choose your trail.*
- **2.** Make sure to wear comfortable shoes, boots or snowshoes, and bring a bottle of water, magnifying glass, binoculars, small mirror, pencil and camera.
- **3.** Carry out the suggested activities, while using the eco-friendly tips for hikers.
- **4.** When you get home, complete your diagnosis and share your discoveries with your friends.
- * Get a map of the trails from the Parc d'environnement naturel de Sutton, the Réserve naturelle des Montagnes-Vertes, the Sentiers de l'Estrie, the Ruiter Valley Land Trust or the Sutton Tourism Office,

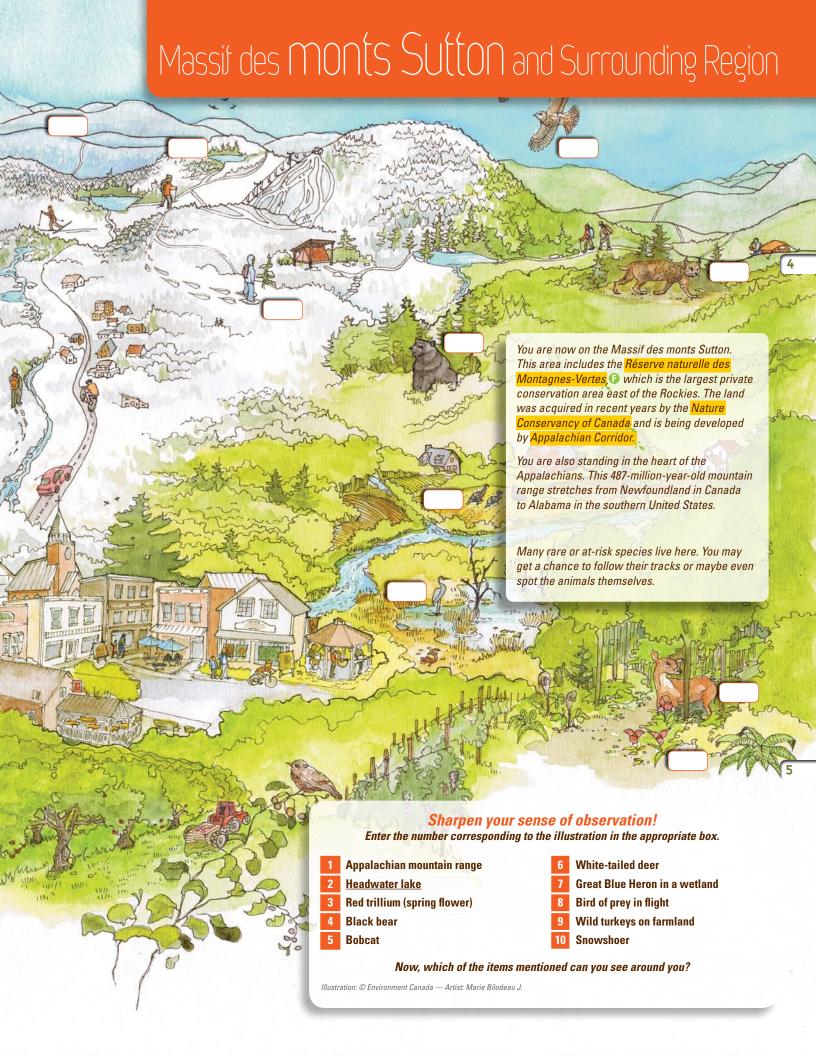
Black bear

Photo: © Jianchun/Dreamstime.com

<u>Underlined</u> words are defined in the glossary on page 23.

In the electronic version of this document, available on the BioKits website, the highlighted words are hyperlinks to websites.

Information available in French only.



Today we are visiting:



Trail:		
Date:	Season:	
Departure time:	Return time:	
Team of explorers:		
GPS coordinates (optional):	Temperature:	°C

WEATHER







■ Sunny

☐ Partly cloudy







□ Rainy

□ Snowy

☐ Windy

Illustrations: © Environment Canada — Artist: Caroline Brunet Photo: © iStockphoto.com/Jan Neville

and time of your nature outing will all influence which animals, plants and natural phenomena reproduction and blooming for instance—that you observe. Return often so you can observe the natural world of the Massif des monts Sutton from different

Pausing en Route

"I have a room all to myself; it is nature."

- Stop for a few minutes in a spot that intrigues you.
- 2. Use all your senses to observe the phenomena happening in the woods. Are the trees in bloom? Can you hear the frogs croaking? Can you smell the decomposing soil?
- 3. Imagine you are a bobcat. Crouch, lie down or bend over and look between your legs. Do you see anything you had missed before?

RIBBIT, RIBBIT, RIBBIT

Male wood frogs croak in early spring to attract females. They then fertilize the thousands of eggs that the females deposit in the water. In May, try to find these gelatinous masses in small temporary ponds.

Wood frog eggs Photo: © Isabelle Grég Photo: © iStockphoto.com/Lezh

Play it safe! Some plants and mushrooms may be toxic. If you're not sure, don't touch them.



Plant Diversity

At first, as you make your

way up, the landscape will mostly consist of sugar maples, yellow birches and American beeches. As you climb higher, you will see white birches and balsam firs. At the very top, conifers such as fir and red spruce will be more abundant. Pay attention to the vegetation and you will see these changes!



☐ Sugar maple



☐ Yellow birch



☐ Hobblebush



1, 2, 3, discover nature's elders. Try to find the following trees and shrubs during your outing and check them off as you see them.

Touch the bark and describe its colour and texture so that you can recognize the trees even in winter!



American beech



☐ Black cherry



Striped maple

Sugar maple, American beech, birch and hobblebush photos: © Isabelle Grégoire Black cherry photo: © Bill Cook, Michigan State University, Bugwood.org Striped maple photo: © Chris Evans, River to River CWMA, Bugwood.org

A CLOSER LOOK AT NATURE

Continue exploring by observing the underbrush plants. Crouch down and take out your magnifying glass to find

- ☐ a plant with small hairs that help it stay moist
- a plant with thorns that repel hungry visitors
- ☐ a tiny plant that forms a carpet

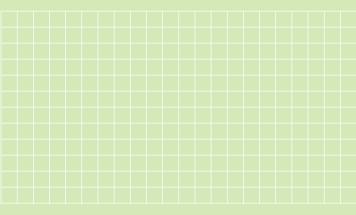
Have you made a strange or intriguing discovery?

Observe the ferns around you. These non-flowering plants are believed to have appeared close to 360 million years ago. Back then, they measured more than 20 m high, as tall as a tree! Today, we still find tree ferns in tropical regions.





Draw or describe it:



Have a look at two different ferns. Using your magnifying glass, **look under the leaves** (called fronds). Do you see small brown or yellow clusters? These structures contain <u>spores</u>, which are used for reproduction.

The spores can also develop on other parts of the frond or on fronds that are not leafy, as in the case of the sensitive fern.

Change in Season

OPERATION CHARM

The first weeks of spring are crucial for springtime plants, which undergo most of their life cycle then. The plants take advantage of the maximum amount of sunshine at ground level to grow and bloom rapidly before tree leaves block out most of the light.

In the springtime, try to see some of these treasures that abound in the maple forest.

If you were a pollinator, what would attract you to these flowers?

Photos: © Isabelle Grégoire

red trillium smell like raw meat, which attracts flesh flies—an effective strategy to ensure pollination!

TAKING OVER NEW GROUND

Plants have many ways of dispersing themselves.

For example, maple seeds are housed in a

wing-shaped structure that enables them to

travel. Do you think humans and animals can

Look around you and look under your shoes. Do you see a seed or fruit that is illustrated here?

Experiment: Throw a seed or fruit that you find and

observe what happens. How do you think these seeds











Yellow trout lily



Dutchman's breeches



Carolina spring beauty



Large false Solomon's seal

From season to season...

Eco-friendly tip:

Many of them must grow 5 to

10 years before producing

Please do

not pick them!

their first flower!

I am the serviceberry. Like other trees, I sleep all winter long. When springtime comes around, I grow sweet flowers that feed the starving pollinators. Since I am unable to travel, these wonderful allies enable me to reproduce.

During the summer, the sun helps me grow, and I feed those craving my delicious tiny fruit. In the fall, I lose my leaves and have a well-deserved rest.

It is the cycle of seasons.

Downy serviceberry

oto: © John Ruter, University of Georgia Igwood.org



Different shapes...







Exploding capsule





Parachute

Maple fruits photo: © Steve Hurst, USDA-NRCS Plants Database Cone illustration: © Isabel Julian Helicopter, cansule, berries, parachute illustrations: © Isabelle Grégoire

Draw a seed or a fruit:

spread seeds?

and fruit travel?



Amateur Mycologists

Whether on the ground, tree bark or dead wood, mushrooms decompose the abundant organic matter. In doing so, they help produce nutrient-rich soil.

Many different species of mushrooms are found on the Massif des monts Sutton. Some are edible, but others are poisonous. So, unless you are a specialist, do not touch them!

Find a mushroom and, using your mirror, bend down and carefully look under its cap. Are there gills, folds or tiny tubes? That is where the spores, which are used for reproduction, are found.



<u>you know that....</u> The visible part of the mushroom represents only a very small part of this organism. Underground is a network of filaments called hyphae. These are what decompose organic matter.

Animal Diversity

CREEPY CRAWLERS!

They are everywhere in the water, air and soil. Insects and other invertebrates are valuable allies for nature and humans. In the forest, they work non-stop at decomposing dead leaves and other organic matter. They are a key source of food for many animals, in addition to playing a major role in pollination.









harvest to pollinators such as bees, ants, butterflies and flies.



Observe a snag (standing dead tree) or carefully lift a log off the ground to see creatures scurrying about.

How many kinds of bugs do vou see?

Remember! Be sure to put everything back where you found it after your observations.

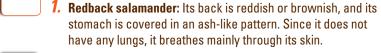
Snag photo: © Doug Lemke/Shutterstock.com Illustrations: © Environment Canada Artist: Louise-Catherine Bergeroi Fly photo: © iStockphoto.com/Dirk Rietschel

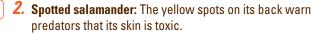
Between Land and Water

Throughout your outing, you will encounter <u>temporary ponds</u> and marshy areas. These <u>wetlands</u> are essential to the reproduction, feeding and development of many species, including amphibians. To top it off, they also filter water and help control flooding!

Would you be able to recognize these?

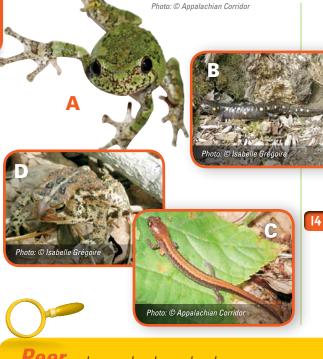
Match the number with the photo of the species.





Gray treefrog: This small treefrog lives in trees and can change colour in a matter of minutes, going from grey to brown and then to green. Camouflage guaranteed!

4. American toad: Its glandulous skin contains a toxin that protects it from predators.



Peer under a rock or log and perhaps you will see a salamander. **Carefully put everything back when you have completed your observations.**

Answers: 1C, 2B, 3A, 4D

A HEALTHY ECOSYSTEM

We all depend on natural <u>ecosystems</u>. They provide living species with clean **air** and **water**, **fertile soil** and **shelter**. They provide us with the materials we need to produce our medication, clothing and food, among other things. **Healthy ecosystems** are therefore crucial to the survival of all species.

Amphibians need a <u>habitat</u> that provides them with food, water, camouflage and breeding areas.

Citizen Science

Worldwide, the survival of amphibians is seriously threatened by pollution, and habitat loss and degradation. Help monitor frogs and toads in Canada by taking part in the Frog Watch program,





Special Mammals

THE FISHER, AN **AMAZING PREDATOR!**

This member of the weasel family is the region's greatest hunter. It roams the forest day and night in all seasons. It is known as one of the few predators brave and agile enough to hunt porcupines. As a result, its head, neck and chest end up covered in quills!

If you were a fisher, what would you find to eat?

Sample one-month menu for an adult fisher:

- one snowshoe hare or two squirrels
- 60 mice
- one porcupine

THE BOBCAT AND ITS PREY

The bobcat will eat any of the small mammals in the forest including the snowshoe hare. Interesting fact: The snowshoe hare and the

bobcat both have long, powerful hindlegs that enable them to run quickly in the snow. Who will win the race?

> Snowshoe hare in its winter coat Photo: © Amber Estabrooks/

HOW EASTERN CHIPMUNKS "CHATTER"

Eastern chipmunks use a variety of sounds to communicate. They can utter hundreds of chip-chip calls a minute for 10 minutes! By doing so, they warn one another about danger, mark their territory and stay in contact while storing their winter reserves.



White-tailed deer droppings

Detective for a Day

Follow the traces left behind... Most animals are discreet or nocturnal, but they leave many traces behind them.

Like a detective, **observe closely** to spot signs of their presence. No need to go very far—animals also use these trails when there are few hikers out.

Check the signs you noticed during your outing:



- Animal footprints in the mud or snow
- Branch browsed by a deer or moose, or nibbled by a hare or porcupine
- Bark stripped off by a deer or moose
- Claw marks on a tree
- Droppings
- Squirrel's or bird's nest in a tree or woodpecker hole
- Other (hole in the ground, eggs, fur, bones, deer or moose antlers, quills, calls or smells)

Did you know that... Black bears adore beechnuts, the nuts from the American beech." The nuts' high nutritional value helps bears store fat for the winter.

Photo: © Environment Canada



Winter is an excellent season for observing footprints in the snow. Observe their shape, number of toes, direction in which the animal is travelling and its gait.





A mysterious feline.
Is it a cougar's footprint?
(Answer below)



Because they have few predators, white-tailed deer are very abundant in the region. Wintertime and hunting are the only real means of population control. Illustration: © Isabel Julian



Answer: This is a bobcat's footprint. A cougat's footprint is very similar, but it is larger, measuring between 9 and 10 cm.

CHANGING ALTITUDE

At approximately 700 m in altitude, you will notice changes in the landscape. You will go from a forest dominated by deciduous trees to one in which conifers are more abundant. A winter hike is a great way to learn about conifers.

Conifers, Show Me Who You Are!



Find two conifers. Take turns closing your eyes and touching their needles. Try to guess the type of conifer by having other members of your group ask you the following questions:

- Are they bunched together or separate from one another?

Check your answer against the conifer descriptions listed here.

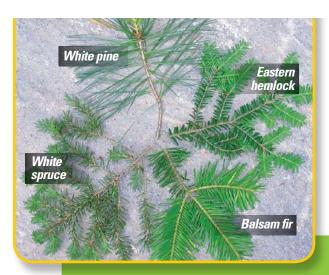


Photo: © Isabelle Grégoire

Balsam fir: Flat, shiny and fragrant needles with rounded tips. Two light blue lines appear under the needle.

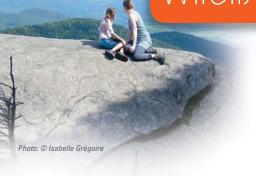
White spruce: Short, square needles that are prickly and bluish green in colour. They give off a harsh smell when crushed.

Red spruce: Short, square needles that are prickly and yellowy green in colour.

Eastern hemlock: Very short and dark green flat needles with rounded tips. Two light blue lines appear under the needle.

White pine: Long needles grouped into bunches of five needles.

q



At the highest point of your hike, take two deep breaths and admire the broad natural features stretching out before you.

Wildlife corridors are areas that allow plants and animals to spread or travel from one <u>habitat</u> to another to ensure access to food, shelter and breeding areas. Large mammals such as the bobcat, cougar and black bear need large uninhabited wilderness areas to survive.

In Canada, habitat loss caused by human activities is the main threat to biodiversity. By maintaining wildlife corridors that link regions yet to be developed, we increase the chances for the survival of all species, including humans.

How much space do you think you need to provide for all of your needs? Discuss this among yourselves and, when you get home, calculate your ecological footprint.



The Big Bad Wolf?

For the past century or so, the grey wolf has been absent from the region because of overhunting and the reduction of its home range due to urban and agricultural development.

Treasures worth protecting!

At the Massif des monts Sutton, some species are becoming rarer or are endangered... They deserve to be treated like the treasures they are!

Myth or Reality? The **cougar** is a species likely to be designated threatened or vulnerable in Quebec. Once present throughout North America, it was hunted heavily because its fur was valuable and people feared for their livestock. Although the cougar is quite rare in Quebec, unconfirmed sightings in the Massif des monts Sutton have been reported in recent years.

Among the Conifers

Listen to bird calls. If you hear wee-o, wee-o, wee-o-ti-t-ter-ee, perhaps a **Bicknell's Thrush** is nearby. It is so rare and so extremely sensitive to human activities such as logging that it has been designated a vulnerable species in Quebec and around the world.



Photo: Dan Busby © Environment Canada

Its disappearance has had a major impact on the <u>food chain</u>, since it helps to control the population of its prey, such as the white-tailed deer.

I Breathe Through My Skin

At the bend of a small stream, you may be able to spot a **northern spring salamander**, a species that has no lungs. A vulnerable species in Quebec, it is currently found only in the southern part of the province.



Photo: © Appalachian Corridor

Have you spotted any of these species? Help conservation efforts by reporting your observations to Appalachian Corridor.

Photo: © iStockphoto.com/Eric Isselée

Invasive <u>exotic species</u> are a huge threat to biodiversity. Often introduced both accidentally and intentionally by humans, they endanger the survival of <u>indigenous species</u> because they tend to crowd them out. Competition is fierce!

On your way back, keep an eye out for invasive species!





Japanese knotweed:

Also known as Mexican bamboo, this plant was introduced in North America at the end of the 1800s as an ornamental plant.

In addition to growing very rapidly, it releases a toxin in the soil which prevents the growth of other plants. It is invading the banks of the Sutton River near the village at an alarming rate.

Emerald ash borer:

The larva from this small insect, a native of Asia, feeds on ash wood. Present in Quebec since 2008, it causes major damage along its path. If you notice this insect, a general yellowing of the leaves or D shaped marks on the trunk of an ash tree, please contact the Canadian Food Inspection Agency at 1-866-463-6017.

Photo: © Klaus Bolte, CFS-SCF, NRCan-RNCan

Glossy buckthorn:

This plant comes from Europe, western Asia and North Africa. It invades mostly wetlands. It is rarely attacked by pests, and the deep shadow created by its foliage hinders the growth of indigenous species.

Eco-friendly tip:

To prevent the spread of wood-boring insects, avoid transporting firewood from one region to another. **Use local wood** only when it is permitted.

Glossary

Ecosystem: System consisting of living organisms and their physical environment in interaction.

Exotic species: A species not native to the environment in which it lives.

Food chain: Succession of living organisms that feed off one another in a predetermined order.

Habitat: Natural living environment of an animal or plant species.

Headwater lake: High-altitude lake whose water flows into a river or another lake.

Indigenous species: A species that lives or grows naturally in a region without having been introduced there.

Pollinator: Animal, such as a bee, butterfly, hummingbird or bat that transfers pollen from one flower to another.

Spore: Reproductive element of mushrooms, algae and certain plants such as ferns.

Temporary pond: Small, shallow body of water that dries out in the summer.

Wetland: Land submerged under water, temporarily or permanently, and characterized by the presence of plants adapted to water-saturated soils.

Photo: © Isabelle Grégoire



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My Diagnosis

The biodiversity of the natural environment visited:

You just finished taking a hike that was rich in discoveries! Keep them fresh in your mind.

Complete a diagnosis of your visit by filling in the following information.

Note: This diagnosis can be printed directly from the BioKits website and used for other visits.

Check the boxes that apply	Excellent!	Not bad but	Several things must be improved!	
General impression regarding the location visited				
Animal diversity				24
Plant diversity				
Presence of wetlands				
Presence of wildlife corridors				
Existence of a protected area with limited access				

Explore other BioKits and complementary activities by visiting ec.gc.ca/biotrousses-biokits.

Presence of a waterway, pond or lake

Signs of human disturbance: visible pollutants, dumping, logging, etc.

Presence of exotic invasive species

Number of roads, snowmobile or ATV trails crossed during the hike

In which column did you check off the most boxes?

This will give you a good general idea of how well the area is doing in the conservation and protection of biodiversity. The thought of taking action out in "the wilderness" may seem overwhelming at first. Here are a few suggestions to get you started.

Recommendations:

Enjoy this environment and help preserve species at risk in the area by acting in a responsible, ethical way when outdoors.

Encourage friends, family and community members to follow your example.

Take pictures of specific points of interest, like areas where animals feed or rest, or patches of flowering plants. Revisit these places with your photos and see how they change over time.

Moderate

You can also discover the different species in the region by joining a group of wildlife observers to survey birds, frogs or plants in the area.

Many heads are better than one! Talk to people about your concerns; they might join your improvement efforts.

Learn to identify invasive alien species. Record and report them; if possible, help organize a friendly gettogether to remove them. 25

Wood Turtle Photo: © Appalachian Corridor

Think Back on Your Outing

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Back home, create a keepsake of your excursion by producing a drawing, story, poem, photo, collage or other souvenir!

Don't forget to identify the species you photographed: borrow an identification guide from the library or do an Internet search.

Back Home

How will you help conserve biodiversity in the region? Decide on a specific action that you can take as a family!

Get interested and involved in preserving your surroundings. Become a member of a local organization devoted to the development, restoration or conservation of the Massif des monts Sutton.

> Monarch Photo: © iStockphoto.com/

AmbientIdeas

Harleguin blue flag Photo: © Chantal Lepire

Leave dead trees in place and do not burn the branches: animals use these for shelter and food.

Become an environmentally friendly gardener. Do not use pesticides. These are prohibited in Quebec!



Use indigenous plants in your landscaping. Try attracting pollinators and birds - even better

Volunteer to take part in organized clean-ups or hikes.



Compost naturally fertilize's the soil and encourages biodiversity!



Photo: © iStockphoto.com/Martine Doucet



Contribute to the safeguarding of exceptional ecosystems or to the creation of wildlife corridors by donating land through the **Ecological Gifts** Program or contact your local conservation group.

Buy certified products that come from sustainable logging operations.



Vegetables photo: © Ivonne Wierink/Dreamstime.com Grass and dandelions photo: © iStockphoto.com/ MikhailMishchenko and Alasdair James

Find Out More

BIODIVERSITY AND HIKING IN THE SUTTON REGION

Appalachian Corridor

Les Sentiers de l'Estrie 🖯

Parc d'environnement naturel de Sutton ³
Réserve naturelle des Montagnes-Vertes ³

Ruiter Valley Land Trust

apcor.ca

lessentiersdelestrie.qc.ca

parcsutton.com

rnmv.ca

valleeruiter.org

BIODIVERSITY IN GENERAL

Biodivcanada

Canadian Museum of Nature Ducks Unlimited Canada Environment Canada — Nature

Hinterland Who's Who

Nature Conservancy of Canada

biodivcanada.ca nature.ca ducks.ca/en ec.gc.ca/nature hww.ca/en

nww.ca/en natureconservancv.ca

HABITAT STEWARDSHIP AND ECOLOGICAL GIFTS PROGRAMS

Ecological Gifts Program Fondation de la faune du Québec Habitat Stewardship Program for Species at Risk ec.gc.ca/pde-egp fondationdelafaune.qc.ca/en ec.gc.ca/hsp-pih

Red fox Photo: © iStockphoto.com/GlobalP

SPECIES AT RISK

List of threatened or vulnerable animal species of Quebec
List of threatened or vulnerable plant species of Quebec
Species at Risk Public Registry

www3.mrnf.gouv.qc.ca/faune/especes/menacees/liste.asp mddep.gouv.qc.ca/biodiversite/especes/index.htm sararegistry.gc.ca

ECO-WATCH PROGRAMS

Atlas of Amphibians and Reptiles of Quebec ¹
Education and Water Monitoring Action Group
NatureWatch

Pollination Canada

Regroupement Québec Oiseaux

atlasamphibiensreptiles.qc.ca g3e-ewag.ca/home.html naturewatch.ca/english pollinationcanada.ca

quebecoiseaux.org/index.php?lang=en

OUTDOOR AND NATURE YOUTH ORGANIZATIONS

Cercles des Jeunes Naturalistes 🙃

Scouts Canada

jeunesnaturalistes.org scouts.ca

INVASIVE EXOTIC SPECIES

Forest Invasive Alien Species of Canada

Great Lakes United

Invasive exotic species of Quebec 🧿

Invasive species in Canada

[] Information available in French only.

exoticpests.gc.ca

glu.org/en/campaigns

mrnf.gouv.qc.ca/faune/especes/envahissantes/index.jsp

invasivespecies.gc.ca



Photo: © Isabelle Grégoire

Explore other BioKits and complementary activities by visiting ec.gc.ca/biotrousses-biokits,

Également disponible en français sous le titre: BioTrousse du massif des monts Sutton

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PRODUCTION TEAM

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Production: CLD de Brome-Missisquoi, CDES, Environment Canada's Biosphere

Research and writing: Isabelle Grégoire
Coordination: Guylaine Beaudoin, Liane Bruneau, Claude Joyal
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Photo of bobcat on front cover: © iStockphoto.com/twildlife

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